

HEALTH HAZARDS OF MICROWAVE COOKING

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When one begins a home, start a restaurant, organise a kitchen for a church hall, temple, or community centre, microwave oven would be in the priority list. It is a dream for every young housewife to own a microwave oven to use for convenient quick cooking and warming up of food. Close friends, or relatives may give one as a wedding gift. As they are so convenient and energy efficient, can a housewife be without one?

So far for the bright side, but seriously thinking, the hazards are so serious that one would be suspicious and careful in using such a beneficial apparatus, at the end of reading this article.

Our enzymes in the gut that digest and break down our food for easy absorption is usually cooked at 100C, by steaming, or on open fire. Microwave cooking is neither natural, nor healthy, cooks at over 200C, and is far more dangerous to the human body than one could imagine. Our enzymes that have evolved, have come to us down through the ages, and may be unable to digest food cooked in microwave ovens and may even change the chemical configuration.

How do microwave ovens work?

You must have heard about electromagnetic energy, like light waves, radio waves, and infra-red waves, forming part of the electromagnetic radiation spectrum. They are extremely high frequency radio waves. In our modern technological age, microwaves, or energy with short waves, are used for relay long distance telephone signals, television programs, and computer information across the earth or to a satellite in space. Microwave travel at the speed of light (189,282 miles per second).

Every microwave oven contains a magnetron, a tube in which electrons are affected by magnetic and electrical fields in such a way as to produce micro-wavelength radiation at about 2450 Mega Hertz or 2.45 Giga Hertz (GHz).

Shorter the wavelengths faster they penetrate through objects. For instance, sun's rays composed of long wave lengths like ultra violet rays do not penetrate the body but damages the skin only, whilst X-ray penetrate even bone as the wave lengths are even shorter.

All these waves are converted into energy. The energy changes polarity from positive to negative with each cycle of the wave. Think of a magnet. If you wrap a coil or wire round a piece of iron and pass a normal current, it becomes an electro-magnet. This magnet has a north end and a south end. The current passes from the North end to the South end. With each change or cycle, polarity from positive (north end) to south end emanates energy. This in microwaves, polarity changes happen millions of times every second. Food molecules, especially the molecules of water in the cells of tissues, have a positive and negative end in the same way a magnet has a north and a south polarity. This microwave generated from the magnetron bombards the food, thus causing the food molecules to rotate at the same frequency millions of times a second.

In simpler terms, a microwave oven decays and changes the molecular structure of the food by the process of radiation. Microwave ovens should be really called 'radiation ovens'. Will the manufacturers make a market, if thus the name is changed?

Microwaves may either, be reflected, transmitted or absorbed by matter in their path. Metallic materials totally reflect microwaves. Most non-metallic materials such as glass and plastics are partially transparent to microwaves. Material containing moisture, such as food and even people, absorbs microwave energy. If energy is absorbed at a rate greater than the rate at which the material loses energy (ie. rate of cooling), its temperature will increase.

In an enclosed metal oven cavity the microwaves are reflected around the oven walls (echo effect), and absorbed in food or drink placed within. Uneven absorption may cause localise "hot spots". The microwaves penetrate the food or liquid and agitate the water molecules within. In brief the microwaves through agitation heats the intracellular water that helps to cook the food. The cooking time is much shorter than in a conventional oven.

Australian Government, on Radiation & Health Information has issued the following bulletin-

Exposure to sufficiently high levels of microwaves will cause heating. In the case of human tissue, excessive heating could have serious health effects such as deep tissue burns and hyperthermia. The purpose of Australian Standards is to avoid all known adverse health effects by limiting exposures to levels below those at which heating occurs.

Extensive research has provided no substantiated evidence that microwave exposure, at any level, either causes or promotes cancer. Microwaves generated in microwave ovens cease to exist once the electrical power to the magnetron is turned off (like visible light from light globes). They do not remain in the food when the power is turned off. Neither can they make the food or the oven radioactive. Therefore, food cooked in a microwave oven is not a radiation hazard.

All microwave ovens have at least two safety interlock switches which stop the generation of microwaves immediately the door is opened. The design of modern microwave ovens is such that the microwaves should be contained within the oven, but it is still possible for some leakage to occur around the doors of certain microwave ovens. Generally, the required design of oven doors should restrict this leakage to a level well below that recommended by the Australian/New Zealand Standard AS/NZS60335.2.25:2002 Household and similar electrical appliances – Safety Part 2.25: Particular requirements - Microwave ovens.

The Standard specifies a test to assess the level of microwave leakage and states that 'The microwave leakage at any point 50 millimetres or more from the external surface of the appliance shall not exceed 50 watts per square metre'. This Standard applies to ovens designed for domestic applications, even if used in a workplace. The recommended limit is conservative and includes significant safety factors, so that even leakage levels appreciably above the limit will have no known effect on human health.

Surveys by organisations providing testing services have shown that microwave oven leakage levels in excess of the recommended limits are rare and an oven in good condition and used correctly is safe. If an oven appears damaged, it should not be used until a suitably experienced technician has tested the oven and checked that the leakage does not exceed the recommended limit. Routine testing of microwave oven leakage is not considered necessary.

The following news on Cancer come from John Hopkins Hospital researchers, published in its News Letters. This information is being circulated at Walter Reed Army Medical Center.

The findings are that no plastic containers, wrappers should be used whilst food is warmed or cooked in a microwave oven. A chemical called dioxin which is pre-cancerous, and also cause breast cancer, is produced on over heating plastic material. Dioxins are highly poisonous to the cells of our bodies.

Plastics also release dioxins on freezing. It is not recommended to freeze water in plastic bottles.

Recently, Dr Edward Fujimoto, Wellness Program Manager at Castle Hospital was on a TV program to explain this health hazard. He talked about dioxins and how bad they are for us.

He said that we should not be heating our food in the microwave using plastic containers. This applies to foods that contain fat. He said that the combination of fat, high heat, and plastics releases dioxin into the food and ultimately into the cells of the body.

Instead, he recommends using glass, Corning Ware or ceramic containers for heating food. You get the same results, only without dioxin.

(This information on dioxin was obtained from a letter sent by Joe Aloysius to the Daily News, 17 th Dec 2005)

Precautions- for radiation safety in the use of Microwave Ovens.

- Never tamper with or inactivate the interlocking devices.

- Never use the oven without the trays provided by the manufacturer unless specifically allowed in the manufacturer's instructions.
- Never operate the oven without a load (ie. an absorbing material such as food or water) in the oven cavity unless specifically allowed in the manufacturer's instructions.
- Never rest heavy objects such as food containers on the door while it is open.
- Clean the oven cavity, the door and seats with water and a mild detergent at regular interval(do not use abrasive cleaning pads).
- Supervise children using microwave ovens.
- When thawing frozen foods in the microwave oven it is important to thaw the food thoroughly before cooking.
- Do not use microwave ovens for sterilising baby bottles or other food utensils.

Ref: Australian Government- Australian Radiation Protection and Nuclear Safety Agency.